## Decoded Quick-Tips: Fire Door Assemblies

**NFPA 80** – Fire door assemblies (doors, frames, and hardware) are underlined designed and tested to withstand smoke, flames, and hot gases during a fire.  The standard that addresses the requirements for fire door assemblies in depth is NFPA 80 – Standard for Fire Doors and Other Opening Protectives.
Additional requirements for fire doors may be found in the applicable building code or fire/life-safety code, such as the International Building Code (IBC), International Fire Code (IFC), or NFPA 101 – The Life Safety Code.  Fire door assemblies must not be modified in a way that will affect their ability to perform as designed and tested.

**Labels** – Fire door assemblies can be identified by a label on the edge of the door or the rabbet on the frame.  The label must be legible, and will include important information about the assembly – ie. the number of minutes the assembly has been listed to withstand fire, the manufacturer, the minimum latch throw, and/or the indication that fire exit hardware will be installed.  Hardware that is used on a fire door assembly must be listed for that purpose.

**Job-Site Preparations** – If existing fire door assemblies are modified in the field for new hardware, NFPA 80 limits those field preparations to 1-inch diameter holes (except cylinder holes which may be any size).  Typically the holes that may be prepped in the field are mortise lock function holes, holes for labeled viewers (peepholes), and through-bolts.

**Field Modifications** – When field modifications are required that exceed the job-site preparations allowed by NFPA 80, the door / frame manufacturers must be contacted.  Through the manufacturer, the listing laboratory may grant permission to make modifications in the field, based on a description of the proposed modifications.  Permission for field-drilled raceways for electrified locks may be requested using this process.  There is also a tool and a certification program for field-drilled raceways that may be acceptable.

**Filling Holes** – If holes are left in fire door assemblies when hardware is removed, NFPA 80 requires the holes to be filled with the same material as the door or frame, or with steel fasteners.  There is also fire door caulk that has been tested for use in small holes on wood doors.  Covering existing holes with new hardware may not be acceptable to maintain the listing of the fire door assembly, and the door or frame manufacturer should be consulted for advice.

**Field Labeling** – If labels are missing, illegible, or if modifications have been made without prior approval, fire door assemblies may have to be evaluated by the listing agency (such as Underwriters Laboratories or Intertek) in the field and re-labeled.  This process can be costly.

**Self-Closing / Automatic-Closing** – Fire doors must be closed and latched if there is a fire, and equipped with a) a closing device that closes the door each time it is opened (AKA "self-closing"), b) a closing device along with a hold-open device that is released upon smoke detection and allows the door to close (AKA "automatic-closing"), or c) an automatic operator (AKA "power-operated").  If an automatic operator is used, it must be deactivated upon fire alarm so the door becomes self-closing.

**Positive Latching** – Each fire door must be equipped with an active latchbolt to keep the door latched under pressure created by a fire, and most doors in a means of egress are required to unlatch with one operation.  The required latch throw (1/2-inch to 3/4-inch range) is determined by the door manufacturer.  A fire door assembly with an electromagnetic lock would require a latching device in addition to the mag-lock, in order to provide positive-latching.

**Pairs of Doors** – The inactive leaf of a pair of doors may be equipped with automatic flush bolts, or if the pair leads to a room that is not normally occupied by people (ex. boiler room or mechanical room), manual flush bolts may be allowed.  If automatic flush bolts are used, a coordinator is required to ensure that the door leaves close in proper sequence.

**Fire Exit Hardware** – When panic hardware is installed on fire doors, it must be fire exit hardware which is listed for both panic and fire protection.  This hardware will not include the mechanical dogging function, which provides the ability to keep the latch retracted mechanically.  "Less-bottom-rod" (LBR) fire exit hardware may be used if allowed by the door manufacturer, but will typically require the installation of an auxiliary fire pin.

**Electric Latch Retraction** – A fire door may be equipped with hardware which has a latch that is held retracted until it is automatically released/projected during a fire emergency and becomes positive latched when activated by an automatic fire detector.  Electric latch retraction fire exit hardware is often used for this purpose.

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**Electric Strikes** – If an electric strike is used on a fire door assembly, it must be a fail-secure strike which will remain positively latched upon power failure.  Fail-safe electric strikes are not listed for use on fire doors.

**Stairwell Doors** – To allow building occupants to leave a stair if it becomes compromised by smoke, the IBC requires most stair doors to either allow free access from the stair to each floor, or the capability of unlocking the stair side via the fire command center (NFPA 101's requirements are slightly different).  Doors leading to exit enclosures (stairs and exit passageways) are typically fire-rated, so a fail-safe electric strike can not be used to accomplish stairwell reentry.  A fail-safe lock or fail-safe fire exit hardware may be used.

**Inspections** – Many state codes currently require fire door assemblies to be inspected and tested annually, and the 2013 edition of NFPA 80 requires fire door assemblies to be inspected and tested after installation or maintenance work.  Fire doors may need to be inspected and tested after access control work is completed.  There are additional requirements for fire doors that are not directly related to access control – for example, those affecting clearances, signage, gasketing, hinges, and protection plates.

**Permits** – Most jurisdictions require permits for electrical work, including the installation of access control.  The Authority Having Jurisdiction (AHJ) should be contacted with any questions.

*More Decoded Quick-Tips are available at http://www.iDigHardware.com/Quick-Tips.*







The purpose of a fire door is to compartmentalize a building and prevent the spread of smoke and flames. The door shown in these photos protected a nature center and management offices from a fire that began in the maintenance shop. Photos courtesy of Fire Protection Specialist Christopher Taylor, NYS Office of Fire Prevention and Control.